

## CLAIMS

I claim:

1. In an object detection radar device having radar transmitter and radar receiver circuitry, the improvement comprising electronic gain control apparatus adapted to vary gain in the radar receiver circuitry as a function of range to vary the shape of the detection zone of the radar, wherein said apparatus varies said gain by applying a plurality of different corrections to the gain at different ranges.
2. The device of claim 1 where said control apparatus varies gain by digital control using circuitry selected from a group consisting of: digital circuitry, analog circuitry, or a combination thereof.
3. The device of claim 1 where the electronic gain control apparatus comprises an embedded microprocessor and support digital and/or analog circuitry to control said varying of the gain.
4. The device of claim 3, wherein said varying of gain is predetermined and fixed.
5. The device of claim 3, wherein said varying of gain is changeable via software.
6. The device of claim 1 where the electronic gain control is in an RF receiver portion of the circuitry.
7. The device of claim 6, wherein the electronic gain control comprises an electronically controlled attenuator placed in the RF circuitry.
8. The device of claim 6, wherein the electronic gain control comprises an electronic-gain-controlled amplifier used in the RF circuitry.
9. The device of claim 1 where said electronic gain control is in an RF-to-IF portion of the receiver circuitry.
10. The device of claim 9, wherein said electronic gain control comprises mixer voltage bias.
11. The device of claim 9, wherein said electronic gain control comprises local oscillator power variation.
12. The device of claim 1 wherein the electronic gain control is in the signal processor portion of the receiver circuitry.

13. The device of claim 12, wherein the electronic gain control comprises digital processing gain control.
14. The device of claim 12, wherein the electronic gain control comprises threshold limiting of the detected signal.
15. The device of claim 12, wherein the electronic gain control comprises software algorithms written to select varying processed signal strength levels as a function of distance.
16. In an object detection radar device, an electronic control system that controls the effective shape of the object detection zone by utilizing electronically controlled transmitted power variation in the radar transmitter circuitry to vary the transmitted power as a function of the instantaneous search range and thereby effectively shaping the detection zone of the radar as a function of range.
17. The device of claim 16 where the said control system varies power by digital control using circuitry selected from a group consisting of: digital circuitry, analog circuitry, or a combination thereof.
18. The device of claim 16, wherein the electronic control system comprises electronics selected from the group consisting of: an electronically controlled attenuator and an electronic-gain-controlled amplifier.
19. In an object detection radar device having radar transmitter circuitry and radar receiver circuitry, an electronic control apparatus adapted to vary the shape of the detection zone of the radar as a function of distance from the transmitter by dynamically adjusting the gain of a radar during its range sweep cycle by a system comprising tuning of transmitter power.

20. In an object detection radar device having radar transmitter circuitry and radar receiver circuitry, an electronic control apparatus adapted to vary the shape of the detection zone of the radar as a function of distance from the transmitter by dynamically adjusting the gain of a radar during its range sweep cycle by a system comprising tuning of receiver sensitivity.
21. A method of controlling the shape of an object detection zone of an object detection radar system, the method comprising dynamically adjusting gain of the radar during the radar range sweep cycle by applying a plurality of different gain corrections at different ranges, wherein said adjusting is done by a method selected from the group consisting of: tuning of transmitter power, tuning of receiver sensitivity, or a combination thereof.